

Protocol Development Summary

Bald Eagles

Protocol: Monitoring the spatial and temporal trends of the breeding population of Bald Eagles (*Haliaeetus leucocephalus*) in Wrangell-St. Elias National Park and Preserve, Alaska.

Parks Where Protocol will be Implemented: WRST

Justification/Issues being addressed: The CAKN has adopted a holistic view of network ecosystems and will track the major physical drivers of ecosystem change and responses of the two major components of the biota: plants and animals. Thus, the CAKN has identified *Fauna Distribution and Abundance* as one of its top three Vital Signs. In general, the CAKN wants to know where fauna are distributed across the landscape and to track changes in both their distribution and abundance. The *Fauna Distribution and Abundance* Vital Sign comprises monitoring efforts for a suite of vertebrate species spanning the significant elevation gradient found in CAKN parks, and also including species of specific interest within each park. The Copper River in WRST contains a high density of nesting Bald Eagles in interior Alaska; accordingly, the CAKN technical committee identified Bald Eagles as a focal fauna species to monitor in Wrangell-St. Elias National Park and Preserve (WRST). Bald Eagles in WRST are a high profile species that are dependent upon many resources along the Copper River and are ecologically interesting because they nest at the northern edge of the species range. Bald Eagles are top-trophic level predators and they often respond quickly to changes in their environment by changing their breeding activities. Further, Bald Eagles nesting along the Copper River in WRST may face increasing disturbance due to forestry activities and increased human visitation.

Specific Monitoring Questions and Objectives to be Addressed by this Protocol: Our primary interest in monitoring Bald Eagles is to know if the number of nesting birds or their demography is changing. We also are interested in contaminant levels in eggs and eggshell thickness.

The specific monitoring objectives

1. Determine annual levels of nesting territory occupancy, nesting success, and overall population productivity. **Justification:** *Occupancy of nesting territories is an index of population stability. Nesting success and productivity are important measures of population health and indicators of density dependent responses to increases in population size and nearest-neighbor distances.*
2. Describe historic levels and monitor current levels of environmental contaminants (including mercury) and eggshell thickness every five years. **Justification:** *The continual introduction of anthropogenic chemicals into the environment far outpaces research on their effects on Bald Eagles and other wildlife and therefore warrants continued monitoring in WRST.*

Basic Approach: The main objectives of our monitoring plan are to detect changes in nesting territory occupancy, nesting success, mean brood size, and overall population productivity and to monitor the levels of environmental contaminants (organochlorine chemicals and mercury) and eggshell thickness. Our goal is to obtain population estimates, demographic parameter estimates, and contaminants analysis with low (or no) bias and high precision using cost-effective and logistically feasible methods (Thompson et al. 1998).

Sampling area: The sampling area will be the Copper River from Copper and Tanada lakes south to Miles Lake. Based on physiographic differences, the Copper River basin will be divided into three sub-basins: the Upper, Middle, and Lower Copper Rivers (following Steidl et al. 1997).

Data collection: We will use two aerial surveys each year to assess nesting territory occupancy, nesting success, and productivity. An experience wildlife pilot and an experienced observer will conduct the aerial surveys using a small fixed-wing aircraft. Occupancy and breeding activity surveys will be flown in mid-May to determine which territories are occupied and which contain breeding pairs. The productivity survey will be conducted in late-July or early August to determine the number of occupied territories with fledglings. The timing of the surveys follows Steidl et al. (1997). Contaminants levels will be assessed using feather, blood, and egg samples on a 5 year interval.

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Development Schedule, Budget, and Expected Interim Products: National-, regional-, and local-level protocols already exist for documenting nesting territory occupancy, nesting success and productivity and for quantifying environmental contaminants and eggshell thickness. Additional protocol development will consist of writing a protocol that meets NPS standards (Oakley et al. 2003) and developing a protocol for database management and data analysis. We will need to write new sections in the protocol to meet any sampling requirements, and to make the standard protocol specific to WRST including data base management, data analysis, and reporting. This includes describing sampling locations, and documenting how the data are entered in NPS computerized databases, how data are analyzed, and what is expected in annual and contaminant-related reports. The Principal Investigators will produce a draft Bald Eagle monitoring protocol ready for external review by November 1, 2004. After peer review, revision, and approval, we hope to implement this as our second raptor monitoring protocol in spring 2006.

Fiscal Year	Expected Interim Products
FY 2005	Bald Eagle protocol complete (Dec. 2004)
	Assessment of parameter variation from historical data (determines sampling interval) (Feb. 2005)
FY 2007	Initiate Bald Eagle monitoring in WRST

Literature Cited

- Oakley, K.L., L.P. Thomas, and S.G. Fancy. 2003. Guidelines for long-term monitoring protocols. *Wildlife Society Bulletin* 31:1000-1003.
- Ritchie, R.K., and S. Ambrose. 1996. Distribution and population status of Bald Eagles (*Haliaeetus leucocephalus*) in interior Alaska. *Arctic* 49: 120-128.
- Steidl, R.J., K.D. Kozie, and R.G. Anthony. 1997. Reproductive success of bald eagles in interior Alaska. *Journal of Wildlife Management* 61:1313-1321.
- Thompson, W.L., G.C. White, and C. Gowan. 1998. *Monitoring vertebrate populations*. Academic Press, San Diego, California, USA.